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THE EDUCATIONAL MOTIVATION PATTERNS OF SUPERIOR STUDENTS WHO DO AND DO NOT ACHIEVE IN HIGH SCHOOL.

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THIS STUDY SOUGHT TO DISCOVER AND ANALYZE SIGNIFICANT DIFFERENCES IN MOTIVATIONAL PATTERNS AND THE EDUCATIONAL ACHIEVEMENT OF TALENTED STUDENTS. THE OBJECTIVES WERE TO DETERMINE--(1) THE DIFFERENCES IN MOTIVATION TOWARD ACADEMIC ACHIEVEMENT BETWEEN THOSE WHO ACHIEVE AND THOSE WHO DO NOT, (2) THE DIFFERENCE BETWEEN ACHIEVERS AND NONACHIEVERS IN RELATION TO THEIR SELF-CONCEPT, DEVELOPMENTAL HISTORY AND HOME BACKGROUND, SOCIAL ADJUSTMENT, PEER RELATIONSHIPS, AND PARENTS' SOCIAL STATUS, (3) THE RELATIONSHIP BETWEEN ACHIEVEMENT AND NONACHIEVEMENT AMONG STUDENTS OF HIGH ABILITY AND THEIR CONTINUATION OF STUDY BEYOND HIGH SCHOOL, AND (4) THE DIFFERENCE, IF ANY, BETWEEN THE PATTERNS OF EDUCATIONAL MOTIVATION OF BOYS AND GIRLS. IT WAS FOUND THAT HIGH ACHIEVING STUDENTS TEND TO BE MORE HIGHLY MOTIVATED AS MEASURED BY THE INTERVIEW MEASURE OF MOTIVATION AND, IN THE CASE OF BOYS, BY MCCLELLAND'S TEST. VALUE ACHIEVEMENT WAS HIGHER AS MEASURED BY THE SEMANTIC-DIFFERENTIAL AND, ESPECIALLY IN THE CASE OF GIRLS, BY STRODTBECK'S AND DE CHARMS' INSTRUMENTS, AND MORE ADJUSTED AS MEASURED BY THE CALIFORNIA PSYCHOLOGICAL INVENTORY, WHO ARE THEY, AND BEHAVIOR DESCRIPTION CHART INSTRUMENTS. THE GIRLS WERE MORE ACTIVE IN EXTRA-CURRICULAR ACTIVITIES, HAD MORE LEADERSHIP, SAW FATHERS AS IMPORTANT IN THEIR LIVES, WERE MORE RESPONSIBLE AND INDEPENDENT, HAD SOMEWHAT HIGHER SOCIAL STATUS, HAD PARENTS WHO WERE BETTER EDUCATED AND HELD HIGH ASPIRATIONS FOR THEM, CAME FROM SMALL FAMILIES WHERE THEY WERE THE FIRST-BORN OR ONLY CHILD, AND HAD MOTHERS WHO PLACED A HIGH VALUE ON IMAGINATION. (JL)

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I The Problem:

The major purpose of this study is to differentiate between able high and able low achieving high school students on a number of non-intellectual variables. A secondary purpose of the study involves hypothesized sex differences. On those variables where sex differences seem to be important, separate analyses will be made for boys and girls.

The independent variable is achievement with relation to ability. Variability in the above relationship is studied by introducing a number of dependent, non-intellectual variables which are believed will aid in understanding the variability.

II Background of the Study

The central purpose of this study is to learn more about the factors related to achievement and underachievement among able high school students. In the current search for talent in our society, the able underachiever poses a major problem; society needs his talents and they are being

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inadequately developed. In order to ameliorate the problem, we must learn more about the factors which enhance achievement as well as those which impede it.

The majority of the studies on motivation and achievement have dealt (1) primarily with boys and (2) with a narrow range of variables. In this study both boys and girls are included and a wide range of variables and their interrelationships are being studied. For example, interview and test data on both students and their parents will be used in studying factors related to achievement.

There exists speculation as to the non-intellectual variables most closely related to success. The operation of these variables, however, remains unclear. Bray[1] in his monograph Issues in the Study of Talent states that ". . . neither clinical judgment nor psychological test results have as yet yielded definitive evidence of the ways in which personality differences are related to performance."

Anne Roe[2] in a study of American scientists implied the importance of non-intellectual factors in her finding that above a certain level, intelligence is a poor predictor of success. Terman[3] in his study of gifted children states, ". . . everything considered, there is nothing in which the (more successful and less successful) groups present a greater contrast than in drive to achieve and in all-round social adjustment." Rosen,[4] in a study of differential vertical mobility rates among six ethnic and racial groups, found that the differences could be accounted for in terms of the differing cultural and psychological orientations which the groups held. Using a measure of achievement motivation, achievement values, and educational-occupational aspirations for assessing the

orientations of the above groups, he found that his hypothesis was supported after the effects of social class were isolated. Havighurst[5] has developed a theory of educational motivation in which he included (1) unconscious need for achievement, (2) valuing achievement, (3) intrinsic motivation, and (4) social motivation. These in conjunction with certain constitutional and health factors were believed by him to be the most important elements of motivation related to achievement among talented youth.

Some recent research in the area of underachievement has been reported by the Portland group.[6] As a part of their development program for children of exceptional endowment, they compared forty-nine high-achieving boys with forty-nine under-achieving boys. The groups were matched for grade in school, socioeconomic status, and intelligence. Studies were done in three areas: (1) educational adjustment and vocational outlook; (2) personal and social adjustment; (3) family relations.

The high achieving boys were found to be more positive toward school and to hold higher educational-occupational aspirations. The high-achievers were found to be somewhat more stable and to be more self-confident. In the area of boy-girl relations, the under-achievers appeared to be better adjusted and dated somewhat more. The under-achiever tended to associate with peer cliques whom they described as negative toward school. In the area of family relations the parents of high-achievers tended to be somewhat less authoritarian and to have experienced fewer difficulties in bringing up their children. The parents of the high-achievers were also more supportive emotionally than the parents of low-achievers. Significance levels for differences were not reported.

It is obvious from the above references that non-intellectual factors are important determiners in achievement behavior and among them motivational ones receive the major emphasis. A reference to recent work in the area of motivation is therefore appropriate.

In 1947, McClelland[7] and associates began research in the area of achievement motivation (n-achievement). Their findings were published in book form in 1952. In addition to a great deal of information about the achievement motive and related variables, his staff developed a practicable method for measuring achievement motivation. The method calls for a projective (TAT) type test and is scored for achievement thema. Further work in the area of achievement motivation led McClelland[8] to believe that there was a relationship between early independence training by the mother and high need for achievement in boys.

Rosen[9] pursued the study of achievement motivation in terms of its psychological origins. He studied two different kinds of child training practices. One was training to do things well (achievement training) and the second was training to do things without help (independence training). Again, the children studied were all boys. Rosen found that high need achievement was in fact positively related to these two kinds of child training practices. It was found that the mother contributed more to the achievement training aspect, and while both parents contributed to independence training, the father contributed the most. Thus it appears that there is a link between early achievement and independence training in the home and the development of need for achievement in boys. Comparable data are not available for girls.

Richard deCharms[10] was curious as to whether the elaborate method of assessing an individual's motivation developed by McClelland was superior

to simply asking a subject to describe or rate his own motives. Using a nine-item achievement values scale, deCharms compared the results of the two methods on a group of male subjects. He found the correlation between the two measures to be positive, but low. He therefore concluded that those who do verbalize their achievement desires (V-scale) may have developed such conscious needs later in life, possibly in response to adult pressures for becoming successful.

As was mentioned earlier, it is believed that the motives assessed by McClelland's method are formed early in life and possibly less readily available for conscious verbalization.

Two findings by Fred L. Strodtbeck[11] are relevant to this study. In a study of family interaction, values, and achievement, he found that over-achieving boys scored significantly higher than under-achieving boys on need for achievement and on achievement values. His subjects were Jewish and Italian boys and his achievement values instrument (V-scale) was an eight item values scale designed to assess three aspects of achievement values thought to be related to achievement in America.

The above authors have highlighted some of the important variables related to achievement, and have developed some useful instruments for assessing motivational strength and achievement values. The plan of this study is to include a wide range of variables and to study both sexes. Studying girls seems especially appropriate at this time because (1) we need to maximize talent development among all youth, and (2) there is less discrimination against girls in professional and research areas than formerly.

In summary, the above authors have suggested achievement motivation, achievement values, social adjustment, social status, and educational-occupational goals as non-intellectual factors related to achievement

among able youth. In addition, the present writer believes the following variables should be studied: (1) identification with adults important to the student, (2) a number of demographic variables, (e.g., number of siblings, hobbies, educational level of parents, etc.) and (3) parent attitudes toward child rearing. The rationale behind the choice of these variables will be discussed below.

III Educational Achievement Rationale

Probably all able students are motivated to achieve in one respect or another. That is, all are working toward adult status and roles within that status which appear to offer satisfaction of their needs. What are the factors which predispose some able students to perceive high educational achievement as desirable stepping stones to adult status while others view achievement in this area as much less important? The cultural expectations and roles for boys and girls are different in our society. Therefore, the educational achievement rationale for the two groups will be discussed separately.

A. Achievement Rationale for Boys

1. Achievement Motivation

Achievement motivation takes the form of wanting to do ones best at anything one tries. It is believed that this need for high achievement is developed early in life through responsibility and independence training in the home. Further, that the acquisition of this need is best brought about by task requirements which help the individual to see the relationship between what he is doing and the necessity for doing it. Achievement motivation will be measured by McClelland's (TAT) projective instrument.

2. Adjustment (Psychological Health)

The psychologically healthy person is one whose needs have been adequately met. An individual who is psychologically healthy is better able to see the relationship between what is required of him and the reason for doing it since he is relatively free from conflicting needs. Furthermore, he has more available energy for the task at hand than the unhealthy individual. Finally, the healthy individual is better able to distinguish between success or failure on a task and success or failure as a person because his self-esteem is less at stake. Psychological health will be measured by the California Psychological Inventory and two instruments, the Who Are They (sociometric) test and the Behavior Description Chart (a teacher rating instrument) developed by the Quincy Youth Development Commission Staff.

3. Achievement Values

Some individuals place a higher value on achievement than others. They are interested in getting ahead in the world and achievement is their means of evaluating progress. The person who sees education as a means to achievement will be motivated to achieve in this area. It is believed that this type of person will not have as intense a need to do his best as will the type of person discussed in number (1) above, but that he will be interested in doing well enough to use the achievement as a stepping stone to something better. This aspect of achievement values will be measured by Strodtbeck's V-scale.

Another set of values regarding achievement behavior is that which tends to reflect the "nose to the grindstone" type of philosophy. This is still rather prevalent in our culture and finds expression in the schools. It is also related to the "hitch your wagon to a star" type of aspiration. This type of value is probably not very deep-seated, but is one to which most students have been exposed and one on which many students will score high because they feel that they should hold these values. These values will be assessed by deCharm's V-scale.

4. Educational-occupational Goals

Educational and occupational goals are related in that the better occupations require a certain amount of education. The individual whose occupational aspiration requires higher education will generally be a higher achiever than one whose occupational goal doesn't require it. Educational and occupational goals will be measured through the use of a parent and student interview developed by the writer.

5. Non-scholastic Task Orientation

There is a difference in the number of self-selected tasks engaged in by children. The high achiever will in general be functioning better than the low achiever and will be found pursuing more non-required, academically related hobbies.

The student who engages in hobby activities related to education usually has the interest and encouragement of his parents. Since hobby activities are often expensive, it is hypothesized that children from small families will more often be engaged in these activities. Other things (e.g., social status) being equal, the parent with three or fewer children should have more time and resources to devote to each child. Therefore, it is postulated that children from

small families will more often be achievers and also engaged in more self-selected activities which are academically related. Evidence to this point will be obtained from questions on the parent interview.

6. Socioeconomic Status

Higher socioeconomic status groups in general hold higher expectations for their children than do lower socioeconomic status groups. They also have more resources and contacts with which to insure that their children get the best possible advantages. It is true, however, that some lower middle class and upper lower class parents view education as a means to upward mobility. Where this is true these parents will have children who are motivated to achieve. The advantages, however, are with the higher status groups and it is predicted that their children will be higher achievers than the lower status children. The status measure is the Index of Status characteristics developed by Lloyd Warner and collaborators.

7. Adult Identification

Identification with an adult is a tentative formulation of the self in terms of an adult role. If the child identifies with a parent of the same sex and if this parent values educational achievement, the child should be able to achieve with a minimum of conflict. Degree of adult identification will be derived from questions on the student interview.

8. Parent Attitudes Toward Child Rearing

Some parent attitudes appear to influence the child to do his best while other attitudes seem to hold a child back. The attitudes of parents are communicated to the child via interaction and therefore are difficult to assess. It is believed, however, that adequate

measures can be obtained regarding the more gross attitudinal dimensions and that there will be a relation between parental attitudes toward child rearing and achievement. The speculation is that parents who encourage self-expression, value equality, and who hold democratic attitudes toward children will have high achieving children.

Parent attitudes will be measured by the Parental Attitudes Research Instrument (PARI) developed by Richard Q. Bell.

9. Sex and Achievement

During the early school years girls tend to excel boys in achievement. By the time the students enter college the boys have caught up with girls and eventually surpass them in achievement. This phenomenon has been explained in terms of the earlier maturation of girls. In the writer's opinion, differential cultural expectations for boys and girls provide a more comprehensive explanation for the sex differences in achievement at the levels mentioned.

School is a situation which requires conformity in both social behavior and task performance. In our society girls are required to be more conforming than boys. We expect them to stay cleaner, closer to home, and in general, to behave like "little ladies." Thus, the girl is in a school situation which is congenial to her expected role. In addition, she is in a competitive situation with boys where she has the advantage and is rewarded for excelling the boy. The teacher, too, is usually a woman, which means the girl has fewer identification problems.

At the adult level, social pressure to achieve impinges less heavily on the woman than the man. The woman is expected to marry

and her success in life is based (1) on the status level of her husband and (2) on the appropriateness of her status role behavior. The man, however, is expected to achieve in his line of work and to provide income and status for his family. Thus the man's training and experience are directly related to his subsequent work achievement, while the woman's is only indirectly related.

B. Achievement Rationale for Girls

Since achievement related studies have for the most part included only male subjects, there exists little in the way of achievement theory for girls. A partial theory of the nature and development of achievement behavior in girls evolved as this study progressed. It is therefore very tentative, and supplements the last section presented for boys.

Girls achieve via conformity. Conformance behavior in girls is highly rewarded in our society. The able girl who conforms in social behavior and school tasks achieves automatically. The girl whose parents and peers value educational achievement will achieve well through high school and on into college. The girl whose parents do not value higher education will begin to look toward marriage or a job somewhat earlier and educational achievement will decline in importance. The intelligent, high achieving girl who is educationally motivated through the early school years, has little in the way of cultural expectations to sustain her motivation into adulthood. The girl who does maintain high academic achievement through college and graduate school is likely to suffer some loss in adjustment and femininity. She is competing in what has traditionally been man's world.

Although the girl's motivation to achieve academically and professionally has little in the way of cultural expectations to sustain it beyond the early years of college, the girl may be highly motivated to achieve indirectly. That is, she may want to marry an achiever or push

her husband toward achievement. The ensuing statements about achievement behavior in girls point up ways in which girls might be expected to differ from boys. The achievement variables will be numbered to coincide with the rationale for boys.

1. Achievement Motivation

High-achieving girls who are planning to attend college are postponing adult status which comes with marriage for girls. The low-achieving girl who plans to get a job and marry fairly soon after high school is more highly motivated to reach adult status. Since girls see achievement primarily as man's role, it is expected that girls closer to marriage will tell stories with as much or more achievement thema than girls farther away from marriage. Also the girl who is closer to marriage has ceased somewhat earlier to compete with males in the area of achievement and hence may be more free to attribute achievement to the male stimulus figures presented in the TAT type pictures (McClelland's test).

Achievement training and independence training are related to high need for achievement in boys. Just what the relationship is between these training practices and achievement motivation in girls is unknown. We know that the girl's behavior is policed more than that of boys and that independence in some areas is allowed much later. It is speculated that parents who want their girls to achieve and to go to college police their children with more vigilance and for a longer period of time than parents whose aspirations for their daughters are not so high. If achievement and independence training are both necessary to the development of high need for achievement in girls as it is in boys,

then the high-achieving girls are expected to score no higher than low-achieving girls since independence training is lacking in the upbringing of girls.

3. Achievement Values

Even though girls do not ordinarily expect to achieve in the world as a result of their productive efforts, they nonetheless place a high value on achievement. Their role is that of providing emotional support for their husbands. Their satisfactions are thus vicarious rather than direct. Since their success and status is dependent on the achievement of someone else, it is reasonable to believe that they would value achievement very highly. Those with high academic achievement and high aspirations, will value achievement more highly than those with low achievement and low aspirations. It is further postulated that high achieving, high aspiring girls will value independent accomplishment and reward more highly than low-achieving, low aspiring girls. Girls have fewer achievement areas than boys open to them. This, coupled with high demand for conformance behavior, enhances the value which Achievement holds for high achieving girls. The girl seeks recognition which will substantiate her individuality.

4. Educational-occupational Goals

Girls with high educational-occupational goals will be high achievers in high school. These girls are the ones who value achievement and the status and rewards which go with it. They are the ones who will go to college and who plan to marry college trained men. These girls are achieving in order to get into and remain in the achievement stream of things. If they don't attend college, their chances to achieve directly (via occupation) or indirectly (via marriage) are hampered.

6. Socioeconomic Status

In some respects social status is more important to girls than to boys. Since the girl's adult status is influenced by marriage, it is important to be included in the "right" social groups. She may or may not be required to achieve academically in order to belong to these groups. She must, however, dress and behave in an acceptable manner.

If the high status girl is in with a status group by virtue of her family background, she doesn't necessarily have to achieve academically to remain there. All she has to do is to remain in the academic environment until she is able to marry a man who will insure her the status she desires. The high status boy, on the other hand, stands to lose status if he doesn't achieve. He can't depend on someone else as an adult. Social expectations are high for him and he must meet them or suffer a loss in adjustment. It is therefore predicted that high status, low-achieving boys will measure poorer on adjustment than high status, low achieving girls. The Who Are They (WAT) and The Behavior Description Chart (BDC) test scores will be used for comparing these groups.

8. Parent Attitudes Toward Child Rearing

Findings reported by the Portland group, Rosen, and Strodtbeck (cited under Section II of this report)indicate that parents of boys with high achievement and high need for achievement enjoy more emotional support from their parents. It is as if the relationships have been worked out early and relatively clearly between parents and sons. There is little friction as the boy gets older. The boy learns that his future is measured in terms of achievement and once he is

achievement motivated he is on his way.

Girls are more sheltered, and their activities more closely supervised. This vigilance to insure the girls welfare falls in large measure to the mother. Thus if the girl's family values achievement, the mother's task is to keep the girl on the achievement "track" which includes doing well in school and plans for college. She doesn't want her to run with the "wrong" group, become pregnant or engaged. These would hamper her chances for the kind of life her parents want for her.

It has also been postulated that girls achieve via conformity which is heavily rewarded in their case. Thus the parents with high achievement values are fairly demanding of the girl, but at the same time very solicitious of her welfare. The more she conforms the better she pleases her parents (especially her mother), and her behavior is reinforced through reward.

So, while achievement for boys is encouraged via independence; for girls, it is encouraged via dependence in conforming to the parents' standards. Thus it is predicted that high-achieving girls will have mothers who are more authoritarian and controlling than the mothers of low-achieving girls. The opposite was predicted for high-achieving boys.

IV Subjects and Procedure:

The subjects for this study include the top 30% in ability of the tenth and twelfth grade students who were in the Quincy Public High School during the 1957-1958 academic school year. These groups were selected because much data were available on them in the Quincy Youth Development Project files.

The top 30% were selected on the basis of seven group intellectual tests. Three of the seven tests were required on each student and either the Chicago Primary Mental Abilities (PMA) or the California Mental Maturity (CMM) test was necessary for a student to be included. The test scores were in percentiles and the average percentile score for each student in the class was computed. Then the seventieth percentile was computed and all those students above the seventieth percentile were included. The girls and boys were then ranked separately on ability at each grade level. This selection procedure provided 109 twelfth grade students and 120 tenth grade students.

In order to obtain a score which would describe a student's achievement ability relationship in a rank score, it was necessary in addition to the ability rank to obtain a grade rank on each student within his respective group. This was accomplished by assigning a weight to both the grade obtained and to the course subject.

The grades were weighted as follows: A = 4; B = 3; C = 2; D = 1; F = 0.*

The academic subjects (courses of study) were weighted by the writer and the high school principal as follows: Solid academic subjects (e.g., history, math, English) = 3; somewhat academic (e.g., agriculture, typing, industrial arts) = 2; and little academic (e.g., chorus, gym) = 1.

The grade weight was then multiplied by the academic weight for each course and the totals added for the subject's weighted grade. For example, an A in English would receive a score of 12 (i.e., 4 x 3 = 12). The total weighted grade for each student was ranked within his respective group. Thus the ability rank and the grade rank were available for use in deriving an ability-achievement relationship score which could then

*Note: The academic grades used were for the 1956-1957 school year.

be ranked for each student.

It was found that the achievement-ability relationship was brought out most clearly by weighting the grade rank (RG) more heavily than the ability rank (RA). Therefore, the grade rank was multiplied by two and the ability rank subtracted from this score. This discrepancy score (2RG - RA) was then ranked for each student within his or her respective sex group and grade level. The foregoing method provided a measure of the achievement-ability relationship for each student which was referred to simply as the achievement rank. Those students whose achievement rank placed them above the median for their group, e.g., twelfth grade girls, were referred to as high achievers and those whose achievement rank fell below the median for their group as the low achievers. Thus four major groups were made available for study (twelfth grade boys and girls, and tenth grade boys and girls). Each of these groups was divided into high and low achievers (making eight groups) on the basis of achievement rank. This made possible comparisons on achievement, sex, and grade or age level.

The above subjects represent the top talent in their respective grades in a Midwestern river city with a population of approximately 45,000. The community lies within a fertile agricultural region where the major farm products are livestock, corn, beans, and small grains. The industry within the community is diversified and sufficient to provide employment for the majority of the labor force. The wages are higher than in the South and lower than in the more industrialized regions. Only part of the labor force is unionized.

V Hypotheses

The hypotheses will be grouped into subcategories which deal with important phases of the student's life. For variables on which differences

are expected, separate hypotheses will be stated for boys and girls.

A. Achievement Motivation and Achievement Values

1. Achievement Motivation

a. High-achieving boys will score higher than low-achieving boys on need for achievement as measured by McClelland's TAT.

b. There will be no difference between high and low-achieving girls on need for achievement.

2. High-achieving students will value achievement more highly than low-achieving students as measured by the Strodtbeck and deCharms instruments.

3. High-achieving girls will value individual credit more highly than low-achieving girls.

4. High-achieving students will score higher on the student interview measure of educational motivation factors than low-achieving students.

B. Hypotheses Related to Student Adjustment

5. High-achieving boys and girls will score higher on adjustment as measured by the California Psychological Inventory than their low-achieving peers.

6. High-achieving boys and girls will have higher friendship and leadership scores and lower aggressive and withdrawn maladjustment scores than the low-achieving boys and girls.

a. The low-achieving boys will evidence more aggressive maladjustment and the low-achieving girls more withdrawn maladjustment.

b. High social status, low-achieving boys will be more seriously maladjusted as measured by the WAT and BDC than high status low-achieving girls.

7. High achieving students will have been more active than low achieving students in school related activities during junior high school.

C. Miscellaneous Hypotheses Related to Student Data.

8. Where significant differences are found on the values test the high achievers will describe the test concepts more positively than the low-achieving students.

9. High achievers will name fathers as having been important influences in their lives significantly more often than will low achievers.

10. High-achieving students will be more active in religious activities than low-achieving students.

11. High-achieving students will come from homes with higher socio-economic status than low-achieving students.

D. Hypotheses Related to Family Factors:

12. High achievers will have better educated parents than low achievers.

13. High-achieving students will have mothers who report them to be more responsible and independent than will be true for low-achieving students.

14. High-achieving students will have mothers who have higher educational aspirations for their children than low-achieving students.

15. Mothers of high achievers will report their children engaged in more educationally related hobbies than mothers of low achievers.

16. High-achieving students will more often be first-born or only children and will come from families of three or fewer children more often than low-achieving students.

17. Parental Attitudes

a. Mothers of high-achieving boys will receive lower scores on the authoritarian-control factor of the PARI than mothers of low-achieving boys.

b. Mothers of high-achieving girls will score higher than mothers of low-achieving girls on the PARI Authoritarian-control factor.

18. The concepts measured by the Semantic Differential will be valued more highly by the mothers of the high achievers in those instances where the differences are significant.

VI Analysis and Discussion of Data:

The statistical tests used in making comparison between high and low-achieving groups were tests of means, tests of proportions, and analysis of variance. For the first two of these tests the standard normal variable χ^{ab} was used for finding the rejection level of the null hypothesis. The null hypothesis was tested against a one-sided alternative that there was a difference in a specified direction. Therefore a one-tailed test of significance was appropriate except as otherwise indicated.

Each hypothesis is discussed in the order of its appearance in the above section.

A. Discussion of Data Relating to Achievement Motivation and Achievement Values:

Hypothesis 1—(Achievement Motivation)

a. Hypothesis a states that high-achieving boys will possess a greater need for achievement than low-achieving boys. The measuring instrument for hypothesis 1 was McClelland's n-achievement te[illegible]. Each subject told a four-minute story to each of six stimulus pictures. The stimulus figures in all of the pictures were male. The protocols were then

scored for achievement theme and the total score for each subject was used. The tests were scored by a psychologist with previous experience in scoring the test. Using a sample of twenty students the rescoring correlated .97 with the first scoring. Thus the reliability was quite high.

From Table 1 it can be seen that tenth grade high-achieving boys scored higher on n-achievement at the .03 level than did their low-achieving peers. Twelfth grade high*-achieving boys also scored higher on this test than low-achieving boys, but the significance level of .15 was not significant.

*Note: High and low will always refer to high and low achievers in the group being discussed at the time.

Since the high twelfth boys were higher as predicted, the scores for the twelfth grade boys were looked at in terms of the extremes with the middle group omitted. For this comparison the twelve highest achieving twelfth grade boys were compared with the twelve lowest achievers. The difference on this comparison favored the high achievers at the .02 significance level. Thus there is evidence that high academic achievement and high need for achievement are related for boys.

One other finding relating to hypothesis a was revealed by the data. A student could obtain a score on his protocol for achievement imagery on the basis of the evaluation of a fantasied performance in comparison to others, a standard of excellence, its uniqueness, or an involvement affecting self-esteem[13]. It was thought that some important differences between the groups of high and low achievers might be revealed by the sub-score categories. It was hypothesized that if there were differences between the groups on the sub-scores

TABLE 1

Motivation Scores by Grade, Sex, and Achievement (High and Low) on McClelland's n-Achievement test, Strodtbeck's V-Scale, and DeCharms' V-Scale.

Subject Group N's	Measuring Instrument	High Achievers Mean	High Achievers S.D.	Low Achievers Mean	Low Achievers S.D.	P-Value
10th Boys N's=27ea.	n-Achievement	5.96	4.97	3.33	4.95	.03
10th Girls " 33ea.	"	4.18	3.35	4.70	4.28	.64*
12th Boys " 24ea.	"	3.75	1.89	2.92	3.46	.15
12th Girls " 29ea.	"	5.62	4.92	6.21	5.48	.66*
10th Boys 27	Strodtbeck's V-Scale	6.67	1.15	6.11	1.97	.01
10th Girls 33	"	6.82	6.40	6.58	1.03	.13
12th Boys 25	"	6.64	1.12	6.84	.79	.46*
12th Girls 29	"	6.69	.966	6.41	.78	.11
10th Boys 27	deCharms' V-Scale	44.00	9.36	41.59	7.93	.15
10th Girls 33	"	44.21	7.122	39.82	9.69	.02
12th Boys 25	"	40.72	7.26	42.96	8.66	.38*
12th Girls 29	"	43.31	10.12	39.28	8.17	.05

*Indicates the opposite direction from that predicted. (two-tailed test)

that these would be greatest within the involvement categories and that degree of involvement would favor the high achiever. The involvement scoring categories were need, affect, anticipation of success, and instrumental activity relating to an achievement goal. Anticipation of success was judged to be a different sort of involvement category from the other three and was not used.

When all of the high-achieving boys (both grade levels) were compared with all the low-achieving boys on the involvement categories, the high achievers scored significantly more often in these categories--significance level .01. The proportions were as follows:

	Involvement	No Involvement	Totals
Low achievers	21	30	51
Hi achievers	32	19	51
TOTALS	53	49	102

This finding suggests that involvement or the ability to become self-engaged in achievement tasks is a characteristic of the high-achieving boy. Researchers using this instrument may find it profitable to pay more attention to the involvement categories than they have in the past. It seems to this writer that these categories measure emotional reactions of the individual which are probably less influenced by social acceptance types of responses than is true of the evaluation categories.

b. Hypothesis b states that there will be no differences between high and low achieving girls on McClelland's test. A two-tailed significance

test is necessary.

The difference between the high and low tenth grade girls is at the .64 significance level and for the twelfth grade girls the significance level is .66. Although both groups of low-achieving girls score higher on this test the differences are negligible.

This test represents one area where girls differ from boys. Girls who are not motivated to achieve academically may nonetheless be motivated to achieve via marriage. Since they aren't planning to attend college, they may be somewhat more inclined to attribute achievement to the male stimulus figures which appeared in the pictures. The high-achieving girl, on the other hand, is more likely planning to attend college. She is therefore still in academic competition with men and may be less inclined to view achievement as strictly man's role. In any event, the test fails to differentiate significantly between high and low-achieving girls.

Hypothesis 2--(achievement values)

The prediction that high-achieving students would value achievement more highly than low-achieving students was tested by using an eight-item values scale developed by Strodtbeck, and a nine-item scale developed by deCharms.

For convenience in presentation, the findings for boys will be discussed first.

Strodtbeck's scale was designed to measure three aspects of achievement values believed to be related to success on the American scene. The individual who plans for the future, who thinks he can manipulate the world to his advantage, and who

desires individual credit for accomplishment holds values related to success.

From Table 1 we observe that the high achieving tenth grade boys hold these values to a significantly (P = .01) higher degree than do low-achieving boys. In the case of the twelfth grade boys, there is no significant difference. It should be noted, however, that the low-achieving twelfth grade boys scored somewhat higher on this test (P = .23) than did the high achievers.

On deCharms' instrument which was designed to get at what the student overtly said regarding his achievement motivation we again find the tenth grade high boys scoring higher on this test (P = .15). The twelfth grade boys were also consistent with their scores on Strodtbeck's instrument with the low twelfth boys scoring higher (P = .26) than the high boys. Hence there is some support for hypothesis 2 in the case of tenth grade boys, but none in the case of twelfth grade boys.

The only explanation for the reversals between tenth and twelfth graders on these tests is very speculative. The low-achieving twelfth grade boys have failed to live up to the expectations held for them. They are aware of this and are also cognizant of the social values deemed necessary for success. It may be that their high scores on these two instruments represent compensatory behaviors.

The girls at both grade levels came out as predicted on both of these instruments. This is in keeping with the statement of rationale for girls. There it was stated that girls were largely dependent on men for achievement status and thus would value achievement very highly.

The data are presented in Table 1. We see that the high tenth grade girls score ~~significantly (P = .02)~~ higher (P = .13) on Strodtbeck's instrument and higher also (P = .02) on deCharms' instrument. The twelfth grade high girls were higher (P = .11) on Strodtbeck's scale and significantly (P = .05) higher on deCharms' instrument.

High girls at both grade levels were more consistent than boys in valuing achievement. In order to achieve vicariously through a good marriage, they must hold the values associated with achievement. Mothers who have high expectations for their daughters will supervise their behaviors rather carefully. It is believed that this supervision tends to stifle the ambitious girl's individuality. If true, her need for individual credit which would make her stand out would be great. This assumption is discussed next.

Hypothesis 3--It is predicted that high-achieving girls will value individual credit more highly than low-achieving girls. This hypothesis is based on an item from Strodtbeck's V-scale which states that "The best kind of job to have is one where you are part of an organization all working together even if you don't get individual credit." For this comparison the high girls at both grade levels were compared with the combined low girls. The high girls disagreed with the above item significantly (P = .01) more often than the low-achieving girls. The high-achieving girls want individual credit for accomplishment.

Hypothesis 4--This hypothesis was based on the student interview data. This instrument was designed to assess motivational differences between high and low-achieving groups as these differences were revealed through important adult identifications, reading habits,

educational goals, subjects liked, peer influences, etc. The interview was first scored on the sub-scales and then these sub-scale scores added for a total strength of educational motivation score. An illustration as to the way the instrument was scored may be given in relation to the sub-scale on educational goals. A student received a zero if he mentioned no goal; a one if he specified a job following high school, joining the service, trade or business school; two for college; three for an M.A.; and a four if he planned to prepare for one of the professions.

The sub-score data results are included in Table 2--also the total score results. The differences between high and low achievers on strength of educational motivation are very significant in all cases. These differences are revealed by the total score differences in the first section of Table 2. The differences between high and low boys are significant at the .01 level at each grade level and the differences between the girls are at the .02 level in both instances. Thus a personal interview report by the student reveals real differences between high and low-achieving boys and girls.

B. Discussion of Adjustment Findings

Hypothesis 5--stating that high achievers were significantly better adjusted as measured by the California Psychological Inventory (CPI) is strongly supported on the total score by tenth grade boys (.01 level), tenth grade girls (.001 level), twelfth grade boys (.001 level), and meagerly supported by the twelfth grade girls (.18 level). Findings appear in Table 3. The eighteen scales measured by the test appear in the left column of table 3.

The CPI measures eighteen facets of interpersonal psychology. The first six scales measure the areas of poise, ascendancy, and self-assurance. Scales seven through twelve are measures of socialization,

TABLE 2

Strength of Educational Motivation Scores by Sex, Grade Level and Achievement (High and Low) on the Student Interview Measure.

Subject Group	Measuring Instrument	High Achievers Mean	High Achievers S.D.	Low Achievers Mean	Low Achievers S.D.	P-Value
10th Boys N=27	Tot. Score	23.37	4.52	18.63	3.90	.001
10th Girls 33	"	22.12	5.75	18.61	4.315	.002
12th Boys 24	"	22.54	4.93	18.96	6.27	.01
12th Girls 29	"	20.69	5.66	17.41	6.47	.02
10th Boys N=27	Peer Id.	2.59	2.31	2.07	1.90	.17
10th Girls 33	"	3.06	1.98	2.82	1.66	.30
12th Boys 24	"	2.67	2.456	2.96	1.63	—
12th Girls 29	"	2.90	2.28	2.45	2.14	.22
10th Boys N=27	Reading	2.30	1.42	1.41	1.63	.02
10th Girls 33	"	2.00	1.42	1.61	1.50	.14
12th Boys 24	"	2.08	1.29	1.68	1.675	.25
12th Girls 29	"	1.76	1.40	.86	1.70	.01
10th Boys N=27	Goals	2.44	.65	1.67	1.14	.001
10th Girls 33	"	1.82	.3113	1.45	1.06	.07
12th Boys 24	"	2.42	.929	1.50	1.130	.001
12th Girls 29	"	1.52	.945	1.21	1.18	.02
10th Boys N=27	Grades	2.22	.519	1.41	.284	.001
10th Girls 33	"	2.45	.2092	1.70	.3010	.001
12th Boys 23	"	2.00	.302	1.29	1.12	.001
12th Girls 29	"	1.48	1.12	1.52	1.02	--
10th Boys N=27	Monetary Goals	1.67	.62	1.56	.519	--
10th Girls 33	"	1.30	2.016	1.55	.1937	.10*
12th Boys 24	"	1.79	.42	1.66	.484	.16
12th Girls 29	"	1.52	.68	1.31	.627	.35
10th Boys N=27	Subjects Liked	6.59	1.74	5.37	1.80	.01
10th Girls 33	"	5.82	2.31	4.97	1.81	.05
12th Boys 24 (23 Hi & Lo's)	"	6.08	1.91	5.58	2.47	.22
12th Girls N=29	"	6.21	2.65	5.34	2.66	.11
10th Boys N-27	Adults Imp. to. Subj.	5.56	2.75	5.15	1.65	.25
10th Girls 33	"	5.67	1.72	4.52	2.15	.01
12th Boys 24	"	5.58	1.72	5.00	1.29	.09
12th Girls 29	"	5.31	.85	4.72	1.72	.05

*Indicates that the direction of the prediction was reversed. (two-tailed test)

TABLE 3

Adjustment Scores by Sex, Achievement (High and Low) and by Grade Level on the California Psychological Inventory. (1)

(a)

Measuring Scales	10th Hi Boys N=27		10th Lo Boys N=27		P-Value
	Means	S.D.	Means	S.D.	
Total Score	56.16	5.24	52.49	5.63	.01
1. Dominance	57.81	10.86	53.67	13.25	.11
2. Capacity for Status	55.70	9.25	55.56	8.35	---
3. Sociability	56.74	10.40	56.81	10.93	---
4. Social Presence	53.30	7.34	57.48	9.56	.08*
5. Self-acceptance	54.93	6.43	54.67	10.35	---
6. Sense of Well-being	54.56	7.25	52.56	8.24	.17
7. Responsibility	60.67	6.24	50.70	11.66	.001
8. Socialization	59.30	6.32	47.67	12.20	.001
9. Self-control	54.67	8.2	48.59	9.34	.01
10. Tolerance	60.52	8.97	53.33	10.5	.003
11. Good impression	53.07	10.84	50.78	8.45	.19
12. Communality	53.37	5.40	51.56	7.75	.16
13. Achievement vai conformance	59.00	9.78	53.52	10.28	.02
14. Achievement via independence	58.96	8.26	52.52	9.45	.004
15. Intellectual efficiency	60.22	9.89	55.56	7.26	.02
16. Psychological-mindedness	59.67	7.44	54.37	9.29	.01
17. Flexibility	47.60	10.26	42.81	5.60	.02
18. Femininity	50.67	8.62	42.81	10.11	.001

*Indicates the opposite of the predicted direction. (two-tailed test)
(1) Note: The analyses in the above table were based on T-scores.

TABLE 3

Adjustment Scores by Sex, Achievement (High and Low) and by Grade Level on the California Psychological Inventory. (1)

(b)

Measuring Scales	10th Hi Girls N=32		10th Lo Girls N=33		P-Value
	Means	S.D.	Means	S.D.	
Total Score	54.95	4.16	50.27	7.375	.001
1. Dominance	55.41	9.25	51.45	10.70	.06
2. Capacity for Status	56.25	6.75	50.33	11.75	.01
3. Sociability	57.88	7.55	52.70	11.75	.02
4. Social Presence	52.38	8.60	51.64	10.2	.38
5. Self-acceptance	52.94	10.5	50.52	10.1	.17
6. Sense of Well-being	52.69	9.97	46.61	12.8	.02
7. Responsibility	59.16	5.60	49.24	8.50	.001
8. Socialization	55.88	10.3	47.76	10.8	.001
9. Self-control	54.53	9.6	47.79	12.3	.01
10. Tolerance	57.69	5.96	50.33	12.7	.001
11. Good impression	55.41	10.6	51.61	13.25	.10
12. Communality	51.44	7.45	46.09	10.93	.02
13. Achievement via Conformance	57.66	7.5	50.42	12.0	.002
14. Achievement via independence	58.41	7.06	52.79	10.1	.005
15. Intellectual efficiency	56.47	4.50	51.52	9.75	.004
16. Psychological-mindedness	54.84	8.7	54.21	13.16	.41
17. Flexibility	49.41	10.65	51.61	11.9	.42*
18. Femininity	50.66	8.10	48.09	10.06	.13

*Indicates the opposite of the predicted direction. (two-tailed test)
(1) Note: The analyses in the above table were based on T-scores.

TABLE 3

Adjustment scores by Sex, Achievement (High and Low) and by Grade Level on the California Psychological Inventory. (1)

(c)

Measuring Scales	12th Hi Boys N=25		12th. Lo Boys N=25		F-Value
	Means	S.D.	Means	S.D.	
Total Score	56.64	6.05	49.60	7.49	.001
1. Dominance	57.72	10.6	53.96	10.83	.11
2. Capacity for Status	58.64	7.04	48.32	10.46	.001
3. Sociability	58.48	8.82	50.44	8.70	.001
4. Social Presence	-	-	-	-	-
5. Self-acceptance	53.60	8.10	50.20	9.86	.09
6. Sense of Well-being	55.28	10.50	51.24	10.61	.09
7. Responsibility	59.36	9.32	47.12	14.98	.001
8. Socialization	55.00	10.19	49.36	13.18	.05
9. Self-control	53.60	12.46	50.84	11.16	.21
10. Tolerance	56.56	9.70	47.52	11.26	.001
11. Good impression	-	-	-	-	-
12. Communality	53.24	4.90	47.52	14.95	.03
13. Achievement via conformance	61.92	15.33	51.08	18.72	.01
14. Achievement via independence	61.56	14.02	51.36	3.87	.001
15. Intellectual efficiency	56.56	7.40	49.32	11.62	.004
16. Psychological-mindedness	-	-	-	-	-
17. Flexibility	51.40	9.27	46.12	11.88	.04
18. Femininity	-	-	-	-	-

*Indicates the opposite of the predicted direction. (not applicable)
(1) Note: The analyses in the above table were based on T-scores.

TABLE 3

Adjustment Scores by Sex, Achievement (High and Low) and by Grade Level on the California Psychological Inventory. (1)

(4)

Measuring Scales	12th Hi Girls N = 89		12th Lo Girls N = 89		F-Value
	Means	S.D.	Means	S.D.	
Total Score	55.09	5.47	53.73	5.73	.18
1. Dominance	55.79	9.58	50.90	10.51	.03
2. Capacity for Status	52.52	8.44	51.07	9.79	.27
3. Sociability	52.72	8.66	52.21	10.58	—
4. Social Presence	-	-	-	-	-
5. Self-acceptance	52.14	13.41	47.24	11.48	.07
6. Sense of Well-being	53.62	8.97	56.76	6.73	.12*
7. Responsibility	56.28	6.44	55.66	6.51	.36
8. Socialization	57.34	6.32	54.38	7.70	.07
9. Self-control	56.66	9.54	56.72	8.41	—
10. Tolerance	56.41	9.83	55.93	8.50	.42
11. Good Impression	-	-	-	-	-
12. Communality	51.27	7.73	51.14	5.93	—
13. Achievement via Conformance	62.28	13.13	57.17	11.87	.06
14. Achievement via Independence	60.03	14.38	58.21	14.34	.32
15. Intellectual efficiency	56.03	7.19	54.24	7.82	.17
16. Psychological-mindedness	-	-	-	-	-
17. Flexibility	48.93	7.04	50.83	9.77	.40*
18. Femininity	-	-	-	-	-

*Indicates the opposite of the predicted direction. (two-tailed test)
(1) Note: The analyses in the above table were based on T-scores.

maturity, and responsibility. Scales thirteen, fourteen, and fifteen measure achievement potential and intellectual efficiency. The last three scales (16-18) are measures of intellectual and interest modes. As can be seen from the tables, the only exception to the superiority of the high achievers is that the low achieving girls at both grade levels are somewhat more flexible. This raises sense if the high achieving girls are achieving via conformance. This proves to be the case on scale thirteen of this test. We note on this scale that the high achieving tenth grade girls are higher ($P < .002$) and the high achieving twelfth grade girls are higher ($P < .06$). In the case of the twelfth grade girls the only other scale where the difference was greater than .05 was on scale one (Dominance). Dominance, conformance, and rigidity probably have something in common.

There was one scale reversal for tenth grade boys. On scale number four (Social Presence) the low achieving boys were higher. To be significant on a two-tailed test the .04 would have to be .02 and short of the .05 significance level. The explanation for this phenomenon may lie with social status. The low achieving tenth grade boys are as high on social status (Table 6) as their high achieving peers. Social presence may be correlated with status. Since this scale was not included when the test was given to the twelfth grade boys, no comparison can be made.

In addition to the reversal on the flexibility scale for girls, the low achieving twelfth grade girls scored higher on scale six (sense of well-being). Again social status may be at work. The low achieving twelfth grade girls were actually higher ($P < .05$

on a two-tailed test) on social status as shown in Table 6. Another possible explanation for the reversals is that a difference of the magnitude reported could have come about as a result of chance.

Hypothesis 6—High achieving boys and girls will have higher friendship and leadership scores and lower aggressive and withdrawn maladjustment scores than the low achieving boys and girls.

This hypothesis with its two sub-hypotheses (a and b) were tested by using a Who Are They (peer rating instrument) and the Behavior Description Chart (a teacher rating instrument). Both instruments were developed by the Quincy Youth Development Commission Staff. The findings are presented in Table 4.

On the Who Are They (WAT) test, leadership (L.) differentiates between the high and low tenth grade girls at the .01 level, but fails to differentiate between tenth grade boys. At the twelfth grade level it differentiates between high and low boys at the .01 level and for girls at the .05 level. The hypothesis receives some support.

On the teacher rating Behavior Description Chart (BDC) the teachers differentiated the high and low achievers on leadership at the .004 level for tenth grade boys, the .003 level for tenth grade girls, the .04 level for twelfth grade boys, and the .02 level for twelfth grade girls. When both the student and teacher measures of leadership are considered, the hypothesis that high achievers possess more leadership ability, is strongly supported.

Friendship was measured only by the WAT. The only group approaching significance is that of the twelfth grade boys and the significance level is only .10. Friendship scores do not differentiate between high and low achievers in this study.

TABLE 4

Student Ratings (VAT), Teacher Ratings (BDI), and Activities Ratings (JAI), by Sex, Achievement, (High and Low) and by Grade Level.(1)

	10th Boys Achievement					10th Girls Achievement				
	Hi N=27		Lo N=26			Hi N=32		Lo N=32		
	Mean	S.D.	Mean	S.D.	P-Value	Mean	S.D.	Mean	S.D.	P-Value
VAT										
Agg.	50.1	8.2	56.0	9.9	.01	48.5	8.2	51.8	8.4	.05
Wd.	47.2	7.8	51.2	7.8	.03	48.2	9.2	52.7	7.5	.01
L.	56.0	9.6	54.3	10.0	-	59.9	8.8	54.6	8.1	.01
F.	53.0	10.7	53.8	11.7	-	58.4	11.0	55.4	9.4	-
BDI										
Agg	46.5	8.3	56.3	9.6	.001	44.3	8.5	47.9	7.8	.04
Wd.	47.8	9.3	45.9	11.2	-	44.6	7.2	47.1	8.8	.11
L.	56.3	8.8	49.6	9.2	.004	60.4	7.3	55.0	8.6	.003
JAI										
	50.	10.8	53.3	9.1	-*	57.7	7.7	54.6	10.6	.01

	10th Boys Achievement					10th Girls Achievement				
	Hi N=26		Lo N=26			Hi N=29		Lo N=29		
	Mean	S.D.	Mean	S.D.	P-Value	Mean	S.D.	Mean	S.D.	P-Value
VAT										
Agg.	44.7	7.0	51.8	8.8	.003	45.9	8.8	44.4	7.2	-*
Wd.	46.4	9.5	45.8	7.6	-	45.1	9.6	47.6	8.8	-
L.	55.9	8.8	52.8	10.7	.01	60.7	8.5	56.9	10.4	.06
F.	56.2	10.2	58.8	7.9	.10	56.7	8.9	54.0	8.6	-
BDI										
Agg.	47.3	7.6	49.9	8.3	.13	45.1	7.4	47.3	8.4	-
Wd.	45.1	10.8	43.8	8.8	-	48.1	9.5	48.8	10.5	-
L.	57.6	9.5	52.9	8.3	.04	60.1	8.6	55.8	7.3	.02
JAI										
	55.8	8.7	51.4	11.0	.07	54.4	8.3	50.9	7.7	.05

*Indicates that the direction of the prediction was reversed.
(1) Note: The analyses in the above table were based on T-scores.
(2) Agg. (aggression), Wd. (withdrawn), L. (loneliness), and F. (friendship).

The aggression dimension (Agg.) of the WAT differentiates between high and low achievers in the case of tenth grade boys (.01 level) and tenth grade girls (.05 level). At the twelfth grade level it differentiates only for boys (.003 level).

The aggression dimension on the BDC (teacher rating instrument) differentiates for the same groups. Tenth grade boys are differentiated at the .001 level, tenth grade girls at the .04 level, twelfth grade boys at the .13 level. The hypothesis that high achievers would be less aggressive is supported by both measures enough in the case of the twelfth grade girls.

The withdrawn dimension (Wd) of the WAT differentiates only for the tenth grade students. Here we see that the students themselves differentiate between high and low-achievers at the .03 level for tenth grade boys and at the .01 level for tenth grade girls.

Teachers (BDC) differentiate between high and low achievers on the withdrawn dimension only in the instance of the tenth grade girls and here the significance is at the .11 level. Withdrawn maladjustment is thus seen somewhat more clearly by the students than by teachers, but fails to differentiate between high and low achievers as well as does aggressive maladjustment.

Hypothesis 6_{ab}--The prediction that low-achieving boys will evidence more aggressive maladjustment and that low-achieving girls will evidence more withdrawn maladjustment is based on the assumption that aggression is more acceptable from boys.

Evidence supporting this hypothesis may be observed by inspecting Table 4. In addition the means for the combined low boys and combined low girls are presented below for both measures.

WAT	Lo Boys	Lo Girls
Agg.	53.5	48.1
Wd.	45.9	49.6
BDC		
Agg.	53.1	47.7
Wd.	45.5	46.3

As can be observed from the above figures low boys are indeed seen as more aggressive than low girls both by peers and teachers.

When we look at the means for withdrawn maladjustment we find that the students (WAT) see girls as more withdrawn. This is consistent with teachers (BDC) ratings, although the latter do not differentiate as well. This may be due to teachers being less concerned with withdrawn maladjustment in the classroom situation. It poses less threat than does aggressive behavior.

Hypothesis H_2--High social status, low-achieving boys will be more seriously maladjusted as measured by the WAT and BDC than high status low-achieving girls. This hypothesis is based on the assumption that achievement expectations impinge more acutely on the high status boy than on the high status girl. The boy must achieve in the world to retain his status, while the girl needs only to marry within her status. An Index of Status Characteristics (ISC) score was available on every student in the tenth and twelfth grades. The students at each grade level were divided into four status groups as follows: A. (upper and upper-middle); B. (lower-middle); C. (upper-lower); and D. (lower-lower). The tenth and twelfth grade boys (combined) who were in the lowest third of their respective groups in achievement and whose ISC scores placed them in groups A or B were compared with tenth and twelfth grade girls selected on the same basis. The data

appear in Table 4A below.

TABLE 4A

BDC and WAT Aggressive Maladjustment (T-scores) of Boys and Girls With Achievement and Status Constant.

	10th and 12th Gr. Boys			10th and 12th Gr. Girls		
	Hi ISC--Low Achievement			Hi ISC--Low Achievement		
	Mean	S.D.		Mean	S.D.	P-Value
BDC	N = 13			N = 20		
Aggr.	54.69	3.65		46.85	2.61	.001
WAT	N = 14			N = 20		
Aggr.	57.21	2.73		49.40	9.03	.001

The boys are significantly (.001 level) more aggressive as measured by each of the instruments. Thus the low-achieving, high ISC boy is aggressively maladjusted whereas the low achieving, high ISC girl scores below the class mean on aggressive maladjustment.

The reader will probably have noticed that these findings are in line with the data in Table 4 for low-achieving students. The interesting aspect to the writer lies with the evidence presented by the WAT scores on these fourteen high ISC, low-achieving boys. These boys are seen by their peers as more aggressive than the low achievers without status taken into account. The teachers also see these boys as somewhat more aggressive than the average low achiever.

Hypothesis 7--The last entry in each section of Table 4 pertains to this hypothesis. The prediction was that high achievers would have been more active in school related activities during junior high school.

This prediction is supported at the .01 level for tenth grade girls, the .07 level for twelfth grade boys, and the .05 level for twelfth

grade girls. The difference was not significant in the case of tenth grade boys. The high achiever is thus generally more active in school related activities prior to his entry into high school.

C. Miscellaneous Hypotheses Related to Student Data

Hypothesis 8—This hypothesis is based on the values (Semantic Differential) test and states that where significant differences exist, the high achievers will view the concepts more favorably.

First, a brief description of the test will make the following discussion more clear. The Semantic-Differential test was adapted from Osgood's test[14] for the purpose of measuring meanings or attitudes held by students toward selected concepts.

In adapting the test for this study, the attempt was made to select concepts and word-pairs which would allow the student to describe the extent to which he valued the various concepts. Concepts were chosen which were believed to be related to achievement behavior. The concepts were yourself, mother, father, student, work, competition, success, love, faith, imagination, and school. The fourteen word-pairs (used for describing the concepts) were factored and two distinct factors emerged which were referred to as the evaluative and industry factors. The word-pairs which contributed to the evaluative factor were ugly-beautiful, sad-happy, worthless-valuable, and good-bad. For the industry factor the word-pairs, hardworking-lazy and hazy-clear, were the ones with high loadings.

A three-way analysis of variance design was used for testing the differences between (1) all high vs. all low achievers, (2) all boys vs. all girls, and (3) tenth vs. twelfth graders.

Table 5 shows the differences on each concept (where significant) first on the evaluative factor and then on the industry factor.

The Evaluative Factor

1. High vs. low achievers--The high achieving students valued school more highly at the .001 significance level. Work and imagination approach the .05 level, but failed to reach it. When the three concepts were combined the difference in favor of the high achievers was at the .001 level. These findings are as predicted.
2. Girls vs. boys--Girls evaluated more highly school (.05 level) and love (.01 level). They valued faith and imagination more highly, but failed to reach the .05 significance level. Boys evaluated competition more highly than girls at the .05 level.
3. Tenth vs. twelfth graders--The tenth graders valued student and imagination more highly than the twelfth graders at better than the .05 level. This significance held when work was included.

The Industry Factor

1. High vs. low achievers--High achievers described the concepts school (.001 level) and self (.05 level) as significantly more positive (hardworking and clear) than did low achievers. Student and competition were described more positively by the highs (.05 significance level).
2. Girls vs. boys--Girls described school (.01 level) and love (.05 level) as significantly more hardworking and clear than did boys. They were more positive on work and faith, but failed the .05 significance test.
3. Tenth vs. twelfth grades--The tenth grade students described school more positively (hardworking and clear) than did twelfth graders.

TABLE 5

Analysis of Variance--High vs. Low Achievers, Boys vs. Girls, and 10th vs. 12th Grades on Semantic Differential Concepts (Evaluative Factor)[15]

	Achievement High vs. Low N's = 113		Sex Girls vs. Boys N = 124 N = 102		Grade 10th vs. 12th Grade N = 120 N = 106	
Concepts	F	P	F	P	F	P
School	18.55	.001	6.10	.05	2.41	N.S.
Student	- -	N.S.	3.85	.10	5.99	.05
Work	3.10	.10	- -	N.S.	--	N.S.
Competition	3.30	.10	5.10	.05*	--	N.S.
Love	- -	N.S.	9.70	.01	--	N.S.
Faith	- -	N.S.	3.78	.10	--	N.S.
Imagination	3.78	.10	- -	N.S.	--	N.S.

Analysis of Variance—High Vs. Low Achievers, Boys vs. Girls, and 10th vs. 12th Grades on Concepts (Industry Factor).

	Achievement High vs. Low N's = 113		Sex Girls vs. Boys N = 124 N = 102		Grade 10th vs. 12th Gr. N = 120 N = 106	
Concepts	F	P	F	P	F	P
School	29.17	.001	9.99	.01	9.68	.01
Self	5.02	.05	- -	N.S.	- -	N.S.
Student	4.24	.05	- -	N.S.	- -	N.S.
Work	- -	N.S.	3.35	.10	- -	N.S.
Competition	3.9	.05	- -	N.S.	- -	N.S.
Love	- -	N.S.	5.85	.05	- -	N.S.
Faith	- -	N.S.	3.5	.10	- -	N.S.

*Significance test findings are in the direction of higher valuing of concepts by High Achievers, Girls, and 10th graders except as indicated by *
*Boys valued competition more highly than girls.

In summary, this instrument reveals that high achievers evaluate more positively the concepts school, work, and imagination. They describe as more industrious (hardworking and clear) the concepts school, self, student, and competition. Thus the high achiever places a higher value on the concept school, and on work and imagination which are necessary for academic success. Implementary to these values they see themselves as persons and students more actively engaged in the competitive school situation. Girls, except for competition, view the concepts more positively and as being more industrious than do boys. The tenth grade students are more positive than the twelfth graders.

Although no hypothesis was formulated as to girls' more positive expressions on the Semantic-Differential, the finding is consistent with the rationale which viewed the school as a particularly favorable place for girls to meet their needs and receive rewards.

Hypothesis 9--This hypothesis is based on the belief that mothers are seen in role importance similarly by both high and low achieving students, but that fathers are less important as positive influences in the life of the low achiever. This hypothesis stems from the identification section on rationale.

The high achieving groups in all instances named fathers more often as having been important influences in their lives than did the low achievers. When all highs were compared with all lows, the difference was significant at the .002 level. The low achievers mentioned important adults in their lives about as often as the high achievers--the difference was that the low achiever tended much more often to bypass the father and mention a minister, teacher, or some other adult as having been important to him.

Hypothesis 10--Information regarding religious activity was obtained through the student interview. The theory behind this hypothesis was that the high achiever would be functioning more adequately than the low achiever and that religious activity would be one more area in which he could find an outlet for his energies. For this comparison all high achievers were compared with all low achievers (High and Low N's = 113 each). The percentages falling in the three categories for the question on religious activity were as follows:

Very Active:		Somewhat Active:		Not Very Active:	
Hi's	Lo's	Hi's	Lo's	Hi's	Lo's
50.44%	31.86%	24.78%	32.74%	19.62%	23.01%

No significance test was made but the picture presented is consistent with the prediction. A few students failed to answer the question and some had no church affiliation and were therefore not included in the established categories.

Hypothesis 11--Hypothesis eleven is based on the assumption that high status families have higher expectations and more resources for helping their children live up to their expectations than is true for lower class families. Thus the hypothesis that high achievers will have higher ISC scores than low achievers. The findings are presented in Table VI.

The hypothesis is supported at the .04 level for tenth grade girls and at the .02 level for twelfth grade boys. There is no difference in the case of tenth grade boys and a rather substantial reversal in the case of the twelfth grade girls. This finding on twelfth grade girls was discussed in connection with the California Psychological Inventory. The support for this hypothesis is meager so far as this study is concerned. The subjects in this study, however, are a select group who are above the mean ISC for their grade level.

TABLE 6

Index of Status Characteristics (ISC), by grade, sex, and Achievement(1)

Group	High Achievers Mean	S.D.	Low Achievers Mean	S.D.	F
10th Grade Boys N's=27	37.19		37.41		N-Sig.
10th Grade Girls N's=33	58.0	9.78	53.85	9.52	.04
12th Grade Boys N's=24	55.52	5.63	49.76	8.10	.02
12th Grade Girls N's=29	52.97	6.7	55.38	6.84	.10*

*Indicates the reverse of the prediction.
(1) Note: The analyses in the above table were based on T-scores.

D. Discussion of Parent Data:

The parent data was gathered through personal interviews with mothers, the administration of the Parental Attitudes Research Instrument (PARI), and the Semantic-Differential test of values. The comparison was made between mothers of all high achievers and mothers of all low achievers on the interview data. Only two of the 120 tenth grade mothers were missed by the interviewers and ten of the 109 twelfth grade mothers were missed. There were more than one hundred mothers of high achievers and about one hundred mothers of low achievers used in the following comparisons. The mothers of low achievers were somewhat less willing to cooperate with us, but we felt the over all cooperation was excellent.

Tests of proportions were used in analyzing the parent data (Wallis and Roberts, "Statistics--A New Approach," pp. 427-431).

Hypothesis 12—This hypothesis stated that high achievers would have parents who were better educated. The educational dividing line was arbitrarily set at the high school level. For the analysis parents with high school or less were given a zero score and those with high school plus some college, a plus score. None of the high achievers' parents attended college as predicted. The significance level was .01. The proportions were as follows:

	Some College f	H.S. School or Less 0	Totals
Mothers of Lo Achievers	48	163	211
Mothers of Hi Achievers	67	135	202
TOTALS	115	298	413

Hypothesis 13—Hypothesis thirteen which stated that parents of high achievers would report them to be more independent and responsible was tested separately for independence and responsibility. The answers mothers gave to the questions on responsibility were written down and then the interviewer checked the degree of responsibility on a five-point scale. The scale range was from very responsible to not very responsible. In the comparison of high mothers' statements with low mothers' statements the decision was made to give a plus score on each question to the student whose mother rated him unequivocally as responsible and a zero score when the statement indicated some lack of responsibility. This means that all of the ratings below the top rating were combined or collapsed into a zero rating.

The proportion of high achievers' mothers when compared with low achievers' mothers who unequivocally rated their children as very responsible

was extraordinarily high with a difference in favor of the high achievers at beyond the .001 level ($\chi = 3.46$). This finding is consistent with the CPI scores on the Responsibility Scale.

Independence was handled in the same manner as responsibility, but the difference on this measure was not as great. The difference in favor of the high achievers was significant at the .05 level. This smaller difference may or may not be the result of combining boys and girls. Evidence to be reported in connection with the PARI instrument that mothers of high-achieving girls are more authoritarian, strict, and controlling may be a factor in depressing the significance level on the above independence test.

Hypothesis 14--This prediction states that mothers of high achievers will hold higher educational-occupational aspirations for their children than will mothers of low achievers.

The mothers included for the comparison on educational aspirations were only those who aspired that their children attend college vs. those who didn't aspire this for their children. Trade school, business training, etc., were not included. The following proportions indicate the numbers involved.

	COLLEGE		
	Yes	No	Totals
Low Mothers	53	20	73
High Mothers	81	9	90
Totals	134	29	163

The difference was significant at the .004 level supporting the hypothesis.

The occupational aspect was tested by categorizing the mothers into those who wished their child to enter a profession vs. those who did not so aspire. This is not a clean-cut test since college attendance is

usually necessary for entering a profession. It is interesting, however, that the mothers of low achievers differ less on this measure than on the college aspiration measure. The significance in favor of the high achievers' mothers is just below the .05 level ($\chi = 1.60$).

This may indicate that the mothers of low achievers hold more unreasonable goal expectations for their children than do mothers of high achievers.

Hypothesis 15--In the statement of rationale the view was expressed that high-achieving students would be engaged in more academic related activities than low achievers. For data, the mothers of the students were asked about the hobbies and special interest areas of their children. The different hobbies were listed and Dr. Bowman and the writer then divided them into academic related and non-academic related. We judged them as to their potential contribution to academic work. The agreement was high and those we agreed to be potentially academic related were reading, electronics, collections, chess, science, maps, writing, dramatics, and poetry. The groups were compared on the number of academic related hobbies reported by mothers of the two groups.

Below are the numbers reported.

HOBBIES

	Acad. Rel.	Non-Acad. Rel.	Totals
Low Mothers	31	155	186
High Mothers	71	127	198
Totals	102	282	384

The differences are obviously in favor of the high achievers and the significance level is better than the .001 level. The high achiever is either encouraged, or allowed to engage in, more hobbies which are judged related to academic achievement.

Hypothesis 16--High-achieving students will come from small families (three children or less) and will be the first-born or only child significantly more often than will be true of low-achieving students. If the first part of this statement is true then the second part would be also since the chance of a child's being a first-born is greater in a one to three child family than in a larger family.

The reasoning behind this prediction was that there would be more parent time, attention, and resources available to children from small families than would be true in larger families. Similarly the first child for a time doesn't have to share his parents and an only child never does in the same way later siblings do.

Families were divided on the basis of three or fewer children and four or more, and then the family size for high and low-achieving students compared. The figures are as follows:

STUDENT

	Three or Fewer Children	Four or more Children	Totals
Lo Achievers	76	34	110
Hi Achievers	86	19	105
Totals	162	53	215

The difference favoring a high achiever coming from a small family is significant at the .02 level. Since this part of the hypothesis is as predicted and related to the second part, it is not surprising that the significance level is even higher for the second part of the hypothesis. That is, the high achiever is significantly more often either the first-born or only child ($P = .005$). Dr. Bettelheim once made a remark which in essence was that interaction is necessary for a child to develop into a worthwhile human being. This, of course, may be something with which

all will agree. It may be, however, that we tend to overlook just how important stimulation, interest, and expectations are to a child.

Hypothesis 17--(Parental Attitudes). The Parental Attitude Research Instrument (PARI) was used for testing the expectations for Hypotheses a and b below. This instrument was factored by Marvin Schaefer, et al.[15] They found three factors which they called authoritarian-control (which included 16--5 item scales), favorable attitudes (three--5 item scales), and hostility-rejection factor (which included three--5 item scales). The total instrument consisted of 23--5 item scales.

The mothers of the 20 (ten from each grade level) highest-achieving girls were compared with the mothers of the 20 lowest-achieving girls (both grade levels). Likewise for the mothers of boys. The findings on the authoritarian control factor are reported in Table 7.

TABLE 7

Means, Standard Deviations, and Probability Levels for Mothers of High and Low Achieving Groups on the Auth.-Control Factor of the PARI

Mothers of Hi Girls (N = 20)		Mothers of Lo Girls (N = 20)		
Mn.	S.D.	Mn.	Sd.	P.
159.4	37	172.30	30.6	.02
Mothers of Hi Boys (N = 20)		**Mothers of Lo Boys (N = 20)**		
Mn.	S.D.	Mn.	Sd.	P.
171.2	34.04	199.85	28.65	.002

Hypothesis a--as predicted, the mothers of the high-achieving boys were significantly lower on the authoritarian-control factor. In addition, the mothers of the highest 20 boys were significantly higher (.04 level)

on the democratic attitudes factor than the mothers of the 20 lowest boys. This is precisely what one would expect.

The scale-by-scale comparisons on mothers of high twelfth boys vs. mothers of low twelfth boys is revealing and appears in Table 8 below.

TABLE 8

Parental Attitudes on PAXI for Mothers of High and Low-Achieving 12th Grade Boys. Probability Levels are Based on a Two-Tailed Test.

	Mothers of 12th Grade High-Achieving Boys (N=22)		Mothers of 12th Grade Low-Achieving Boys (N=22)		
	Mean	S.D.	Mean	S.D.	p
1. Encouraging verbalization	18.23	2.02	17.64	2.10	-
2. Fostering Dependency	11.77	2.81	13.90	3.44	.07
3. Seclusion of Mother	12.23	3.69	11.19	3.53	-
4. Breaking the Will	9.73	2.14	11.67	3.44	.12
5. Martyrdom	9.59	3.87	10.36	3.39	-
6. Fear of Hurting the Baby	12.68	3.96	12.73	2.96	-
7. Marital Conflict	14.64	3.51	14.82	3.14	-
8. Strictness	13.77	3.90	15.77	2.74	.05
9. Irritability	13.00	3.53	12.64	3.82	-
10. Resisting Outside Influence	10.41	3.80	12.36	3.85	.11
11. Satisfaction	11.50	3.80	14.36	3.30	.004
12. Suppression of Aggression	10.41	3.86	11.32	3.18	-
13. Rejection of Reasoning	10.09	3.31	10.00	3.32	-
14. Equalitarianism	16.95	2.38	17.14	2.17	-
15. Approval of Activity	13.36	3.12	15.14	2.10	.03
16. Avoidance of Communication	9.73	2.99	11.95	3.30	.02
17. Inconsiderateness of Husband	11.00	3.81	11.95	3.73	-
18. Suppression of Sex	8.95	2.73	10.95	2.92	.02
19. Ascendancy of Mother	11.14	3.64	12.09	3.93	.05
20. Intrusiveness	9.27	3.56	11.68	4.38	.05
21. Comradeship and Sharing	18.55	1.59	18.87	1.82	-
22. Acceleration of Development	13.32	3.78	15.00	2.43	.08
23. Dependency of Mother	12.73	3.72	12.05	3.47	-

Mothers of the low-achieving boys are higher on scales (2) fostering dependency, (4) breaking the will, (8) strictness, (10) excluding outside influence, (11) deification, (13) approval of activity, (16) avoidance of communication, (18) suppression of sex, (19) secondness of mother, (20) intrusiveness, and (22) acceleration of development. The significance levels range from .004 on (11) deification to .12 on (4) breaking the will. These significance levels are based on a two-tailed test. This array of higher scores on these particular scales by mothers of low achievers is quite impressive. When the mothers of the high and low tenth grade boys were combined with the above twelfth grade mothers and a comparison made between high and low mothers of all boys, the differences gained further support. The combination increased the N's from 22 to 40 in each group and the following scale comparisons were significant at the .05 level or better. Scale (1) encouraging verbalization was the only scale on which the mothers of high achievers scored significantly higher. Remember this comparison is of all (40) high mothers vs. the 40 low mothers. The comparison presented in Table 7 was based on the highest 20 achieving boys' mothers vs. the lowest 20 achieving boys' mothers. Scale (1) is one of the three scales in the democratic attitude factor. On the total group of high mothers vs. low mothers (40 in each group) the mothers of the low achievers were higher (.05 level or better) on scales (2) fostering dependency, (10) excluding outside influence, (18) suppression of sex, (19) secondness of mother, and (20) intrusiveness. Mothers of low-achieving twelfth grade boys were also higher on (15) approval of activity, and (22) acceleration of development.

Hypothesis 5--The high-achieving girls' mothers scored higher, as predicted, on the authoritarian-control factor. The significance was at the .02 level. In line with this finding was the finding on the strictness

scale. All mothers of high-achieving girls (N = 37) and all mothers of low-achieving girls (N = 33) were compared on this scale with the high mothers significantly higher, more strict, at the .05 significance level. One other scale finding which differentiated between the tenth grade mothers only was the equalitarian scale. The mothers of the high achievers were higher (more equalitarian) on this scale at the .02 level. So, while the mothers of the high achievers are more authoritarian, controlling, and more strict, they also provide evidence of holding higher attitudes regarding equality. This may be very important to the high-achieving girl who is being pushed to achieve via conformity. Neither the irritability nor the democratic attitude factors revealed significant differences between the mothers of girls nor did other scale-by-scale comparisons.

Why are girls able to achieve under strict authoritarian control attitudes and boys unable to do so? It looks as though there is a real sex difference operating here.

First, this measure was obtained only on mothers. It was stated in the rationale that an identification with a parent of the same sex who values educational achievement would make it easier for a student to achieve. The high-achieving girl can identify with the strict, authoritarian mother with little role conflict. So so for the low-achieving boy. His mother is apparently the stronger member in his household. She is ascendant, intrusive, authoritarian, etc. She also believes in the suppression of sex (no doubt the male's sex). The low boy's mother sees her job as that of managing her son (and perhaps the father). Boys rebel against this situation because psychologically they can't identify with the mother and on the other hand, they resent deferring to her.

Second, a review of the previous findings is also revealing. The McClosky instrument (Table 1) differentiates significantly between high and low girls. This instrument measures need-achievement values which are based on overt acceptance of social standards. That is, girls are more conforming and are rewarded for conformance behavior. The home requires girls to be more conforming and the school rewards this type of behavior.

On Strodtbeck's instrument it was found that high-achieving girls have a significantly higher need for individual credit than low achievers. This was interpreted to mean that achievement via conformance left their individuality somewhat impaired and that individual credit aided their identity needs. Further evidence from the CPI, Table 3, indicated that the high achievers were somewhat more rigid on the flexibility scale. The high-achieving girls were also significantly higher on the dominance and achievement via conformance scales. For the twelfth grade girls these were the most differentiating scales. Although insignificant, the twelfth grade high-achieving girls were seen as more aggressive by their peers than the low-achieving girls. To the writer these findings appear to be consistent with the PARI findings that the mothers of these high-achieving girls are more authoritarian, controlling and strict with their daughters. It is as if they are going to see to it that their daughters live up to their expectations. As far as school achievement is concerned, they have been successful. There is evidence, however, that low achieving, high status twelfth grade girls can maintain friends and be adjusted without adhering too closely to school standards. These girls already have status security and feel less need to prove themselves.

It may be that there is a relationship between parental attitudes and N-achievement as measured by McClelland's instrument. It was mentioned

that boys who have high N-achievement have been subjected to early intense independence and responsibility training by their mothers. If one assumes that the mother is successful in this training, then it follows that she could be less authoritarian and more democratic later on. That is, working at this wouldn't be so necessary during adolescence. The mothers of the high-achieving boys are indeed consistent with this reasoning. On the other hand, the mothers of the low-achieving boys are still authoritarian and controlling in attitudes, more strict, more intrusive, overconcerned, etc. At the same time they are trying to accelerate the boys' development (scale 22-PARI), and are high on approval of activity (Scale 15). It appears as though they have been quite unsuccessful in instilling responsibility and independence behavior in these boys. To the writer the reason for their failure is clear. They have tried to push the child to grow up while simultaneously encouraging dependency by refusing the child any autonomy. The boy is lacking a strong sex role identification figure--his recourse is to behave immaturely. This shows up in his low N-achievement scores, irresponsibility as reported by mothers, poor adjustment as measured by the CPI, WAT, and ZBC, and finally in low achievement.

The relationship between the PARI findings on the mothers of girls and N-achievement is less clear. The mothers of the high-achieving girls are similar in attitudes to the mothers of the low-achieving boys. It is also true that both of these (high girls and low boys) groups receive lower N-achievement scores (Table 1) than their comparison groups.

The mothers of the high-achieving boys and the mothers of the low-achieving girls are similar in attitudes on the PARI (mean scores 171 and 172 respectively). The children of these two groups of mothers score higher on the N-achievement instrument (Table 1). It looks as though there

is a relation between parental attitudes and N-achievement scores as McClelland suggested, but that the meaning so far as achievement is concerned is different for girls than for boys. That is, need-achievement for boys reflects itself in motivation for college and in academic achievement. At a deep level it may be more important for boys to achieve academically than is true for girls. For boys the ultimate criterion of success is based upon achievement in some line of endeavor. For reaching the top in a profession, higher education is a prerequisite and in business more necessary than in the past. For girls this is not so true. In order to be a success, she needs to learn the appropriate patterns of behavior which will aid rather than get in the way of her husband's success. College experience is probably more relevant here than academic success.

In connection with the N-achievement scores it was suggested that twelfth grade girls who were low achievers were perhaps not so much in competition with men and hence were better able to attribute success to male stimulus figures than high achieving girls. If true, this phenomenon should express itself at the senior level in high school or in college. The girl is now old enough to marry and is nearer a choice point as to career, marriage, or a combination of the two. The following data, while not conclusive, lends some support to this assumption.

Among the N-achievement stimulus pictures there were two pictures of well-dressed men working at desks. There were also two pictures of well-dressed men who appeared to be relaxing. To the two pictures containing well-dressed men actually at work, the high-achieving twelfth grade girls attributed much less need-achievement than did the low achievers (means 1.66 and 2.83 respectively). This difference was significant on a two-tailed test at the 10% level--not highly significant, but supportive of

the view that high-achieving girls are reluctant to tell achievement stories to successful looking men at work. The reason for the high girls' low score is believed to stem from the fact that she will have to compete with this type of man to succeed and this may hinder her chances for a happy marriage. The low-achieving girl sees the man in a productive situation which is precisely where she wants him to be.

To the two pictures (well-dressed man loafing) the reverse was true. The high-achieving girls told stories with more need-achievement themes than did the low achievers. Identification is easier here for the high achiever. Relaxation following success appeals to her. Not so for the low-achieving girl whose success is dependent upon the man's productivity. She is not in the picture and the man is unproductive at present which fact could well threaten her security. The differences in scores to these two pictures is significant at only the .25 level on a two-tailed test. These picture results provide only meager support in explanation of the interesting differences between high and low-achieving girls. A further check on these findings is planned with the tenth grade girls who will be seniors this coming year.

Hypothesis 18--States that mothers of high achievers will value the Semantic-Differential concepts higher than the mothers of the low achievers on those concepts where the difference is significant.

For this comparison only 20 mothers and four concepts were used. Mothers of the ten highest achieving students (two from two of the high achieving groups and three from the two remaining high achieving groups) were compared with mothers of the ten lowest achieving students selected in the same manner. These mothers were compared on the concepts your child, student, success, and imagination across all fourteen word-pairs. A three-way analysis of variance--word-pairs vs. concepts vs. mothers of ten high

and ten low achievers was used for making the comparisons. The difference in the way the mothers described the four concepts on the word-pairs was significant at the .05 level with the mothers of the high achievers viewing the concepts more favorably as predicted. Among the four concepts imagination was the real payoff. Mothers of high achievers described this concept more favorably at beyond the .001 significance level. Taken singly this is the only concept which differentiated significantly.

Interesting differences on concepts by word-pairs are given as follows: on the fast-slow word-pair, mothers of low achievers described their children as faster. On calm-disturbed, the mothers of the highs saw their children as more calm. On the concept success the mothers of highs saw their children as faster than did the lows, and as more clear on the concept imagination.

Related Findings from the Data

As a part of the student interview the students were asked to name the teachers who had been most encouraging and the ones who had been most discouraging. The ten teachers with the most positive mentions were compared with the ten with the most negative mentions on the Semantic Differential. These groups were compared on the concepts fathers (of students), student, success, and imagination, using all (14) of the word-pairs as in the above study of mothers. These findings are presented in Table 9.

As can be observed in the blocks times the columns (B x C) row the encouraging (well-liked) teachers describe the concepts more favorably at better than the .01 significance level. In other words, they value fathers (of students), students, success, and imagination more highly than do the discouraging (disliked) teachers.

TABLE 9

Three-way Analysis of Variance (Word-pairs vs. Concepts vs. Liked and Disliked Teachers)

Source	X^2	Df	Var. Est.	F	P
Rows	277.50	13	21.346	15.742	.0001
Columns (Concepts)	107.31	3	35.770	26.379	.0001
Blocks (Teachers)	39.00	1	39.000	28.761	.0001
RxC	130.33	39	3.342	2.465	.001
RxB	11.61	13	.893	---	Non. Sig.
BxC	21.63	3	7.210	5.317	.01
RxBxC	42.11	39	1.080	---	Non. Sig.
Within	1,366.500	1008	1.356		
TOTAL	1,995.990	1119			

Compared on concepts the results were as follows:

1. The well-liked teachers described students (total word-pair scores) more positively at the .001 significance level.

2. The well-liked teachers described fathers (of students) more positively at the .001 significance level.

3. They valued success more highly at the .04 significance level.

4. There were no significant differences between the two groups on the concept imagin ion on the total fourteen word-pair scores. On specific word pairs this concept was seen differently by the two groups on two word-pairs.

   a. Hardworking-lazy. The well-liked teachers saw imagination as more hardworking ($F = 4.05$; $P = .05$).

   b. Happy-sad. The least-liked teachers saw imagination as more happy ($P = .05$).

Parent-child agreement on goals. A question on the parent interview pertained to degree to which the parents and child agreed on future plans. The proportions of parents from the high and low-achieving groups who agreed with child and those who did not are presented below.

	Agree	Disagree	Totals
Parents of Low Ach.	73	9	82
Parents of Hi Ach.	85	2	87
TOTALS	158	11	169

Although the cell with the two in it looks suspiciously low, the expected frequency for that cell is six. Both the chi square and proportions tests reveal differences between the two groups at the .05 significance level. This finding is interpreted as evidence that high achievers and their parents are working together toward meaningful goals to a greater degree than are low achievers and their parents.

Twelfth graders who attended college. A follow-up of the twelfth graders was made to find out the percentages of high and low achievers who attended college the first year after graduation. The percentages are as follows:

Number Attended College

High Achieving Boys and Girls	Lo Achieving Boys and Girls
66%	39.6%

Boys and girls contributed about equally to the above figures.

Success of high and low achieving twelfth grade students with four developmental tasks. Gordon Liddle[16] (unpublished Ph.D. dissertation, the University of Chicago) analyzed sentence completion tests on the twelfth grade students in order to get a measure of developmental task accomplishment in the areas of self-acceptance, acceptance of others, sex role adjustment, and autonomy. The high-achieving twelfth grade boys and girls were combined and compared with the twelfth grade low achievers to see if there was a difference between them on this measure. The four task scores were added to yield a total score on each student. A low score indicates relatively better success on the tasks.

TABLE 10

Success on Four Development Tasks

High Achievers (Boys and Girls) N = 52		Low Achievers (Boys and Girls) N = 52		
Mean	S. D.	Mean	S. D.	P
8.96	3.43	10.71	3.29	.004

High achieving students have more successfully dealt with the above developmental tasks than the low achievers.

Boys (high vs. low)--The high achieving boys (N = 24) were more successful on (1) sex role development (P = .004), and (2) acceptance of self (P = .02) than low-achieving boys (N - 24).

Girls (high vs. low)--The high-achieving girls (N = 28) evidenced consistent superiority over low-achieving girls (N = 28) on each developmental task, but none of the differences were significant. This finding is in line with the finding for hypothesis 6b. That is, low achievement for a girl is less serious to her adjustment than it is for a boy.

Low Achieving Boys vs. Low-achieving Girls--The twenty-four low-achieving boys were compared with the twenty-eight low-achieving girls. The girls demonstrated superior handling of the developmental tasks in three instances, namely, sex role adjustment, autonomy, and self-acceptance. The difference in sex role adjustment was the only one which was significant at a respectable level however. Here the difference in favor of the low-achieving girl was significant at the .005 level. The conclusion which this writer draws from this evidence is that a girl can make a satisfactory sex role adjustment without high achievement. For the able boy who is underachieving, satisfactory adjustment is much more difficult. Society expects him to produce.

SUMMARY

The top thirty per cent in ability of the tenth and twelfth grade students in the Quincy Public Schools were divided into high and low achievers on the basis of ability with relation to performance (grades). The students were further divided by sex and grade level. Thus there were four major groups divided on the basis of achievement as follows: (1) high and low achieving twelfth grade boys; (2) high and low achieving twelfth grade girls; (3) high and low achieving tenth grade boys; and (4) high and low achieving tenth grade girls.

The above students were compared on motivation, achievement, adjustment, and family factors in order to ascertain (1) differences between high and low achievers and (2) differences between boys and girls.

Findings

1. Motivation--On need for achievement as measured by McClelland's (TAT) projective instrument the high achieving boys scored higher than low achieving boys at both grade levels. On the involvement categories of the test the difference in favor of the high achieving boys was at the .02 significance level. There were no differences between high and low girls on this test.
2. Values--The high achieving girls at both grade levels scored higher on Strodtbeck's and deCharms' achievement values instruments. The high achieving girls (both grade levels combined) scored significantly higher on the need for individual credit "item" in Strodtbeck's test. Tenth grade high achieving boys scored higher (P = .01) than the tenth grade low achieving boys on Strodtbeck's instrument, but failed to reach the .05 level on deCharms' instrument. There were no significant differences between high and low achieving twelfth grade boys on these two tests.

3. Strength of educational motivation as measured by the student interview--This measure differentiated at better than the .02 significance level in all cases with the high achieving students scoring higher on this measure. Involved in this interview measure were the following: (1) peer identification; (2) reading index; (3) educational goals; (4) grades desired; (5) monetary goals; (6) subjects liked; and (7) identification with adults important to the subject (see Table 2 of the report).
4. Adjustment Measures--The high achieving students were better adjusted (.01 level or better) as measured by the California Psychological inventory in all instances except the twelfth grade girls (P = .18).

The high achieving students scored higher on leadership skills as measured by teachers and peers, but not on friendship as measured by peers.

On aggressive and withdrawn maladjustment the low achieving tenth grade students scored higher as predicted. The differences between the high and low achieving twelfth grade students were not significant except in the case of the twelfth grade boys being seen as more aggressive by their peers.

The high achieving students reported that they were more active in school related activities at the junior high level.

5. Semantic-Differential test of values--The high achieving boys and girls valued the concepts school, work, and imagination more highly than did their low achieving peers. In line with higher valuing of the above concepts, the high achievers rated as more active (industrious) school, self, student, and competition. Girls tended to score higher than boys and tenth graders higher than twelfth graders on this test. These higher scores by girls on this instrument coupled with high achieving girls scoring consistently higher than high achieving boys on Strodt-beck's

and deCharms' values tests support the assumption stated in the section on rationale that girls tend to value achievement somewhat higher than boys in our society.

6. Important adults--High achieving boys and girls named significantly more fathers as having been important influences in their lives than did their low achieving peers. It must be borne in mind, however, that the high achieving students tend to come from homes where the father has been relatively more successful as measured by his social status position.
7. Religious activity--High achieving students reported that they were more active in religious activities than did their low achieving peers.
8. Family factors--
   a. High achievers have parents who are better educated (based on highest grade completed) than parents of low achievers.
   b. High achievers have mothers who report them to be more responsible and independent.
   c. High achievers' mothers hold higher educational aspirations for their children than do low achievers' mothers.
   d. Mothers of high achievers report them to be engaged in more educationally related activities (e.g., music, science, etc.) than do mothers of low achievers.
   e. High achieving students come from families where they are the first-born or the only child more often than do low achievers. Small families produce proportionately more high achievers than do large families.
   f. Mothers of high achieving boys scored lower than mothers of low achieving boys on the authoritarian-control factor of the Parental Attitudes (PARI) instrument. The reverse was true for mothers of girls. Here it appears as though boys perform better under democratic

attitudes whereas girls are able (and seem to do better) under authoritarian attitudes. This measure was obtained only from mothers.

g. Mothers of high achieving students valued imagination (Semantic-differential) significantly higher than did mothers of low achieving students.

In brief, high achieving students tend to: (1) be more highly motivated as measured by the interview measure of motivation and, in the case of boys, by McClelland's test; (2) value achievement more highly as measured by the Semantic-differential and, especially in the case of girls, as measured by Strodtbeck's and deCharms' instruments; (3) be better adjusted as measured by the CPI, WAT, and BDC instruments; (4) be more active in extra-curricular activities; (5) have more leadership; (6) see fathers as important in their lives; (7) be more responsible and independent; (8) have somewhat higher social status; (9) have parents who are better educated; (10) have parents who hold high aspirations for them; (11) come from small families where they are the first-born or only child; and (12) have mothers who place a high value on imagination.

Boys differ from girls in that McClelland's N-achievement instrument differentiates between high and low achieving boys, but does not for girls. Girls appear to value achievement somewhat more highly than boys and this is interpreted to mean that girls achieve primarily through conformance behavior through the high school years. In later life the majority of women are somewhat dependent on men for their achievement status roles. They value achievement because they are dependent on someone else for it. Low achieving boys are aggressively more maladjusted than low achieving girls. Finally, high achieving boys have mothers who

are democratic in attitudes toward them, whereas high achieving girls have mothers who are authoritarian and controlling in attitudes.

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